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Docket No. P0149US-7

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants: DENBAARS et al. Examiner: Baumeister  
Serial No. 09/528,262 Art Unit: 2815  
Filing Date: March 17, 2000  
For: MULTI ELEMENT, MULTI COLOR SOLID STATE LED

Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**RESPONSE TO EXAMINER'S ANSWER**  
**TRANSMITTAL**

Sir:

Transmitted herewith in triplicate is a Response to Examiner's Answer for this application.

If any additional fee is required, the Commissioner is authorized to charge Deposit Account No. 11-1580. A duplicate of this transmittal is attached.

Dated: 7/19/04

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7/19/04  
Date

Marianne Middleton  
Marianne Middleton



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
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Inventor : Steven P. Den Baars  
Serial No.: 09/528,262  
Filed : March 17, 2000  
Examiner : Baumeister, Bradley Art Unit: 2815  
Title : **MULTIPLE ELEMENT, MULTIPLE COLOR SOLID  
STATE LED**

ATTENTION: Board of Patent Appeal and Interferences

**REPLY TO EXAMINER'S ANSWER**

**Status of Claims**

The examiner withdrew his rejections of claim 9 and found the claim allowable. Applicants thank the examiner for his reconsideration of this claim, but respectfully disagree with the examiner's characterization of what the prior art teaches. The examiner also stated one of many reasons that claim 9 is allowable.

**Issues**

It is also noted that the examiner's 37 C.F.R. 1.75 rejection of claim 37 is temporarily withdrawn. It is also noted that the examiner's 35 U.S.C. 112 1<sup>st</sup> paragraph rejection of claim 39 is withdrawn.

The examiner indicated that claim 41 was inadvertently omitted from the list of claims that are anticipated by Kaneko, but argues that because claim 41 is so similar in substance to rejected claim 14, and because claim 41 is broader than claim 42, there are no additional issues

raised by further inclusion of this claim within the Kaneko rejection. Appellant disagrees with the examiner's characterization of the similarity and scope of these claims, but does not object to the inclusion of claim 41 under the Kaneko rejection so that the Board can fully consider all issues raised in this appeal.

### Grounds for Rejection

#### The Examiner Relied on Statements From JP '203 That Do Not Disclose, Teach or Suggest The Limitations In 5-7, 14, 24 and 41

The examiner focused on the following limitation from claim 14 in analyzing whether the JP' 203 reference anticipates claim 14:

"said substrate doped throughout with a plurality of impurities such that said impurities simultaneously absorb the light of said active region and simultaneously re-emits a respective color of light."

The examiner similarly focused on the following limitation from claim 41,

"said substrate doped throughout with a plurality of impurities such that said substrate absorbs the light from said active layer, and re-emits more than one color of light."

The examiner found that these claims are anticipated because these limitations are expressly disclosed in JP '203. It remains applicants' position that, after a careful reading of JP '203, it is revealed that JP '203 does not disclose, teach or suggest these claim limitations.

In rejecting both these claims as being anticipated by JP '203, the examiner argues that paragraphs [0023], [0010], and [0014] from JP '203 expressly disclose that

"plural, distinct impurities that re-emit different colors may be doped throughout the substrate." (Exam. Ans. Pgs. 5-6). It is unclear whether the examiner is relying on these paragraphs alone or in combination, and if the examiner is combining these paragraphs, it is unclear how they are being combined. Either way these paragraphs do not support the examiner's position.<sup>1</sup> Upon a careful reading it becomes clear that these paragraphs do not disclose, teach or suggest what the examiner argues, but instead support the appellants' reading of JP '203 and appellants' position that these claims are not anticipated.

Paragraph [0023]

The examiner initially cites paragraph [0023], which provides as follows:

When UV light (32) passes through substrate (21), it is converted to visible light (33) of any of red, green and blue color by means of a transitional element (light emitting centers) and the visible light is emitted from the opposite surface and side surface of said substrate. (Emphasis added).

The term "of any of" prior to listing the red, green and blue colors is an indication the light is converted to one of these colors, not different colors from a plurality of impurities, as argued by the examiner. This reading is supported by the reference to "the visible light is emitted," referring to a singular color of light. This quote when taken as a whole discloses that the UV light passes through the substrate and is converted to red, green or blue light that is then emitted.

This reading of paragraph [0023] is supported by its

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<sup>1</sup> Appellant is relying on the translation provided by the Examiner with his answer, but is doing so Applicant is not admitting that the translation is accurate. Whether accurate or not, the translation supports Appellant's position, and not the Examiner's.

context in JP'203. Paragraph [0023] describes the embodiment of Figure 3 in JP' 203 which shows an LED (22) on a doped substrate (21) with LED light (32) passing into the substrate (21) and emitting as a light (33). Appellants' interpretation of paragraph [0023] is consistent with the device shown in Figure 3. Furthermore, statements in other paragraphs describing Figure 3 support applicants' interpretation, one such statement being in paragraph [0021], which provides as follows:

FIG. 3 is a diagram illustrating the second embodiment of the light emitting element of this invention. . . . Said substrate (21) is a transparent hard substrate doped with a transition element (light emitting centers) that emits red, green or blue. (Emphasis added).

For unknown reasons the examiner ignores these unambiguous statements as to what is disclosed in JP ' 203 and instead, presents and relies upon his unsupported reading of JP'203 to reject applicants' claims.

Paragraph [0010]

Similarly, paragraph [0010] does not support the examiner's position but instead support applicants'. This paragraph provides:

As said substrate (2), a transparent hard substrate doped with an element (light emitting center), which receives the UV light (wavelength in the range of 250-410 nm) emitted from semiconductor light emitting element (3) and generates light of red, green, or blue color, is used. . . . The light emitting center elements that can be added in said substrate base material are elements that are dispersed homogeneously. . . (Emphasis added).

This paragraph unambiguously states that the substrate is doped with an element such that it emits light of red,

green or blue color, yet the examiner relies on this paragraph to support his position that JP '203 discloses a substrate doped throughout with different impurities such that re-emit different colors of light. The examiner's position is contradicted by the very paragraph he is relying on.

When this paragraph introduces the "light emitting center" it clearly states that the light emitting center emits light of red, green or blue color. The reference to the light emitting center elements being dispersed homogenously refers to the elements that emit one of the red, green or blue color.

The statement emphasized by the examiner, "For example, one or several types selected from the following of transition elements may be doped: . . ." is incomprehensible. The statement "transition elements can be doped" is nonsensical. This statement certainly does not disclose that the "plural, distinct impurities that re-emit different colors may be doped through the substrate" as argued by the examiner.

Not only did the examiner misread this paragraph, but he also omitted important portions of the paragraph that support applicants' position. After the portion provided by the examiner, paragraph [0010] further provides:

The amount of the light emitting center elements added should be appropriate so that the desired luminance of the light can be obtained. Examples of the materials for substrate (2) that can be used preferably in this invention include sapphire doped Cr or other transition element, YAG or GGG doped with Nd or other rare earth element, beryl doped with transition element, silicon carbide doped with transition element, spinel doped with transition element, LiYF<sub>4</sub> doped with transition element, magnesia doped with transition element, glass doped with transition element, etc. (Emphasis added).

This description from paragraph [0010] refers to "the" color of light and discloses several examples of materials and dopants for the substrate. Each of the examples discloses a substrate doped with one type of material (e.g. sapphire doped Cr or other transition element) such that the substrate emits one color of light. These examples and the reference to "the" light support applicants' reading of JP '203, that the substrate is doped with a material such that the substrate emits only one color of light.

Just as with paragraph [0023], applicants' reading of paragraph [0010] is consistent with the figures. This paragraph describes the embodiment of Figure 1, which shows light entering the substrate and emitting as a color of light (5). As discussed above, paragraph [0010] unambiguously describes the light the color of light (5) being red, green or blue.

Paragraph [0014]

A full reading of paragraph [0014] also supports applicants' reading of JP '203. The portion of paragraph [0014] cited by the examiner provides that the substrate (2) can be made of a material doped with "at least one type of transition element." This paragraph, however, does not disclose that "plural, distinct impurities that re-emit different colors may be doped throughout the substrate." In fact, the examiner omitted the final statement from this paragraph showing that this description does not comprehend having the substrate doped throughout with distinct impurities. The final statement provides:

In addition, by using a single substrate to form plurality of light emitting units, each of which is composed of said semiconductor light-emitting element and a substrate portion that emits red, green or blue

colors from said semiconductor light-emitting element, it is possible to form a display for color display. (Emphasis added).

Although this statement is somewhat difficult to understand, it is clear that to the extent that the substrate has different dopants that re-emit different colors of light, the different dopants are segregated into different portions of the substrate. There is no disclosure of the substrate being doped throughout with different dopants to emit different colors of light.

This reading of JP '203 is further supported by disclosure in paragraph [0013] (also omitted by the examiner), which provides as follows:

As a result it is easy to manufacture light-emitting elements of red, green and blue colors, respectively, in the same manufacturing process, and, at the same time it is possible to adjust the light-emitting output power and luminance of the light emitting elements of the various colors of red, green and blue, respectively. When color display is performed by setting said light-emitting elements of various colors, it is possible to obtain a display device that can display images with high image quality and with excellent color balance. (Emphasis added).

This description unambiguously discloses that the light emitting elements are manufactured pursuant to the teaching of JP '203 such that it is easy to manufacture element of red, green and blue colors, respectively (i.e. emit red, green or blue). The respective red, green and blue emitting devices can then be used to form a color display.

It is also worth noting that paragraph [0014] describes the embodiment shown in Figure 1 and just as with paragraph [0010], applicants' reading of paragraph [0014] is consistent with the drawings and the other descriptions of the drawing. Figure 1 shows light entering the substrate



and emitting as a color of light (5). As discussed above, the statements in description of Figure 1 from paragraph [0010], the color of light (5) is red, green or blue.

#### Claim 4

The examiner also cited the following portion of claim 4:

"the substrate has a portion that emits at least one of red, green and blue color with the light emitted from the said semiconductor light-emitting element."

The examiner takes the position that this claim language discloses plural types of impurities may be provided - not only in different portions of the substrate - but also within the same region of the substrate. (Ex. Ans. Pg. 6). This claim language, however, makes no reference to impurities and how the impurities are doped within the substrate. This claim simply does not support the position taken by the examiner.

#### Application Examples

JP '203 provides three "Application examples" that are indicated as "LEDs with constitution shown in Figure 3 were manufactured as a test." Each of these application examples is consistent with the applicants' reading of JP '203. The examples include a red LED having a sapphire substrate doped with Cr, a green LED with a sapphire substrate doped with Cr<sup>3+</sup>, and a blue LED with a LiYF<sub>4</sub> substrate doped with Pr. None of these examples provide a device consistent with the examiner's reading, i.e. a substrate doped with plural, distinct impurities that re-emit different colors.

The JP '203 quotes cited by the examiner do not

disclose what is argued by the examiner, but instead support the applicants' reading of JP '203. The figures and application examples also support Applicants' reading of JP '203. There is simply no disclosure, teaching or suggestion of the claim 14 and 41 limitations focused on by the examiner. These claims are allowable over JP '203 and the claims that depend from claims 14 and 41 are also allowable.

**The Examiner Misquotes the Disclosure of Kaneko; An  
Accurate Reading Shows that Kaneko '901 Does Not  
Disclose, Teach or Suggest Limitations In 4-7, 14,  
15, 24, 41 and 42**

The examiner continues to rely on misquotes from the Kaneko '901 disclosure to support his finding that claims 4-7, 14, 15, 24, 41 and 42 are anticipated by Kaneko '901. The examiner represents that the Kaneko '901 discloses that "various dopants may be employed including Cr, Ti and Co (col. 3, line 15). An accurate reading of this disclosure in Kaneko provides, " $\text{Cr}^{3+}$ ,  $\text{Ti}^{3+}$ ,  $\text{Er}^{3+}$ ,  $\text{V}^{2+}$ ,  $\text{Co}^{2+}$ , or  $\text{Nd}^{3+}$  can be used as the activator." There is no disclosure that the multiple dopants Cr, Ti and Co can be used, but instead that one of six different dopants can be used. The very reference relied upon by the examiner again supports Applicants' reading of Kaneko 901.

On page 8 of his Answer the examiner represents that Kaneko '901 discloses that "Various wavelengths of light including white light can be generated (i.e., R,G,B or Y,B) (col. 3, lines 45-50; col. 10, lines 30-36)." On the very next page, and citing the same columns and lines the examiner goes even further and argues that Kaneko '901 discloses "Various wavelengths including white (i.e. B,G,R

or B,Y) light can be selectively generated." An accurate reading of these sections, however, reveals that there is no disclosure of a substrate emitting R,G,B or Y,B, much less selective emission of these colors. Col. 3, lines 45-50 provides:

It should be noted that a light source according to the present invention can be bottom emitting or an edge emitting device, and hence, the present invention may be utilized in a variety of applications, such as optical communication devices and display devices. Furthermore, by utilizing a suitable activator, light with various wavelengths, such as white light can be generated.

This disclosure describes white light emitted by a single activator (dopant), not different colors of light from different dopants that combine to emit a wavelength of light, or selectively emit different colors of light. In fact, there is no mention of R,G,B or Y,B emission from a substrate. The same is true for col. 10, lines 30-36.

The examiner also quotes Kaneko '901 as disclosing that "The substrate may be uniformly doped with a plurality of dopants. (col. 3, lines 15-20)." Column 3, lines 15-20 provides:

$\text{Cr}^{3+}$ ,  $\text{Ti}^{3+}$ ,  $\text{Er}^{3+}$ ,  $\text{V}^{2+}$ ,  $\text{Co}^{2+}$ , or  $\text{Nd}^{3+}$  can be used as the activator. The optical crystal substrate may be doped as it is grown. The optical crystal substrate may be uniformly or non-uniformly doped. In addition, a plurality of dopants can be utilized.

This paragraph does not state that the substrate is uniformly doped with a plurality of dopants, all it says is that a plurality of dopants can be utilized. At best, this statement is ambiguous as to how the substrate is doped with a plurality of dopants and there is no disclosure that each of the plurality of dopants emits a different color of light.

For Kaneko to anticipate claim 14 or for Kaneko to be relied upon to render claim 14 obvious, Kaneko must disclose, teach or suggest, a substrate doped throughout with a plurality of impurities such that said impurities simultaneously absorb the light of said active region and simultaneously re-emits a respective color of light. There is simply no disclosure, teaching or suggestion of this in Kaneko '901. All that is provided is the examiner's misquotes of Kaneko. Claims 41 and 42 have similar limitations that are not disclosed, taught or suggested by Kaneko.

Independent claims 14, 41 and 42 are not anticipated by Kaneko, and the claims that depend from these claims are not anticipated by Kaneko.

**Even If We Were To Assume That JP '203 and Kaneko '901 Disclose What Is Argued By The Examiner, There Is No Enabling Disclosure**

As pointed out in Applicants' Brief, even if we were to assume for argument sake alone, that JP '203 and Kaneko '901 disclose what the examiner argues, the disclosure is not enabling. "[A] § 102(b) reference must sufficiently describe the claimed invention to have placed the public in possession of it . . . [E]ven if the claimed invention is disclosed in a printed publication, that disclosure will not suffice as prior art if it was not enabling." Paperless Accounting, Inc. v. Bay Area Rapid Transit Sys. 804 F.2d 659, 665, 231 USPQ 649, 653 (Fed.Cir, 1986). "An enabling disclosure is not 'tossing out the mere germ of an idea' but the provision of 'reasonable detail . . . in order to enable members of the public to understand and carry out the invention." United States Filter Corp. v.

Ionics Inc., 68 F.Supp.2d 48, 65, 53 USPQ2d 1071, 1085 (D.Mass 1999)

To avoid the enablement question, the examiner in his answer simply stated, "Applicant also argues that even if JP '203 does teach all of the elements (i.e., the substrate doped throughout with plural types of impurities), the reference is not sufficiently enabled. . . .This argument is mooted by the inclusion of the attached non-machine English translation."

Applicants respectfully submit that the non-machine translation does nothing to moot this argument. Instead, the translation supports this argument. There is no detail as to any embodiments that would support the Examiner's reading of JP '203 and Kaneko '901. There are no figures, examples, or descriptions to support the Examiner's reading. There is not even "a germ of an idea" in these references. Applicants again assert that there is no enabling disclosure of what the examiner argues that JP '203 and Kaneko '901 disclose.

**JP '203 and Kaneko '901 Do Not Teach or Disclose What Is Argued By The Examiner; They Cannot Be Relied Upon Render The Remaining Claims Obvious**

The examiner relied on his erroneous reading of JP '203 and Kaneko '901 to find that the remaining claims are obvious. The examiner obviousness rejections are based on these references alone or in combination with other references. As fully outlined above, these references do not teach or disclose what is argued by the examiner, and as a result they cannot be relied upon alone or in combination with other references to render claims 4, 15, 30, 31, 33-40, 42, 54 and 55 obvious.

As also discussed in Appellants' Brief, "It is impermissible to use the claimed invention to serve as an instruction manual or template to piece together the teachings of the prior art so that the claimed invention is rendered obvious." In re Fritch, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Gordon, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984). Even if we were to assume, for argument sake alone, that JP '203 and Kaneko '901 disclosed what is argued by the examiner, there is no reference that teaches or suggests the desirability of the modification and the examiner failed to provide a reference showing motivation for combining the references.

In his answer the examiner states "the final rejection provided ample motivation to combine JP'203 and McIntosh" (Ex. Ans. Pg. 23) and the listed two paragraphs from the final rejection that simply list what the examiner believes would be motivation to combine the references. This is not what the examiner must show. He must show references that suggest the combination. His hindsight observations are irrelevant.


Applicants respectfully submit that the examiner's obviousness rejections of the claims are erroneous.

### **Conclusion**

Applicants respectfully request a finding from the Board that the Examiner's rejections are erroneous and that the claims are allowable over the referenced cited. Applicants also respectfully request that a timely Notice of Allowance be issued in this case.

July 19, 2004

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